(19) Europäisch s Pat ntamt
Europ an Pat nt Office
Offic eur péen des brevets

(11) Publication number: **0 370 755 B1**

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **11.08.93** (51) Int. Cl.5: **B65D 65/40**, B65D 81/26

(21) Application number: **89312046.9**

(22) Date of filing: **21.11.89**

(54) **Container for packaging medicine.**

(30) Priority: **21.11.88 JP 294404/88**

(43) Date of publication of application:
30.05.90 Bulletin 90/22

(45) Publication of the grant of the patent:
11.08.93 Bulletin 93/32

(84) Designated Contracting States:
CH DE ES FR GB IT LI

(56) References cited:
EP-A- 0 148 020
GB-A- 1 384 556

DERWENT, WORLD PATENT INDEX, 24th June 1988, Acc.no. 88-216215; & JP-A-63 151 451 (IDEMITSU PETROCHEM K.K.)

(73) Proprietor: **KABUSHIKI KAISHA HOSOKAWA YOKO**
No. 11-5, Niban-cho Chiyoda-Ku
Tokyo-to(JP)

(72) Inventor: **Satoh, Toyomi**
4-22-10 Higashinippori Arakawa-ku
Tokyo-To(JP)
Inventor: **Hosoi, Kiyonori**
156 Furukawa-cho Saiwai-ku
Kawasaki-shi Kanagawa-ken(JP)
Inventor: **Kinoshita, Katsuji**
2-30-4 Awata
Yokosuka-shi Kanagawa-ken(JP)
Inventor: **Murata, Shinjiro**
8-36-6 Sugita Isogo-ku
Yokohama-shi Kanagawa-ken(JP)
Inventor: **Fukatsu, Shunzo**
35-2 Haraikatamachi Shinjuku-ku
Tokyo-to(JP)
Inventor: **Ichikawa, Tooru**
3-19-2-106 Waseda
Misato-shi Saitama-ken(JP)

(74) Representative: **Heath, Peter William Murray**
FRY HEATH & CO. St. Georges House 6 Yattendon Road
Horley Surrey RH6 7BS (GB)

EP 0 370 755 B1

Descripti n

This invention relates to a container for packaging a medicine, and more particularly to a container which has a moisture proof facility and can absorb odoriferous ingredients emitted from a medicine accommodated therein to prevent foul or offensive odour from being emitted outside of the container.

In medicines generally used, especially oral medicines, a property of being easily soluble in water (a high water solubility) is given to them in view of necessity for dissolving them in a stomach, and a moisture proof facility is required for a container for such medicines.

If the container for the medicines does not have a sufficient moisture proof facility, moisture in the air passes through the container for medicines to enter the container and to react on the medicines accommodated therein to cause discolouration of the medicines and decrease of effect of the medicines.

Press Though Packaging (PTP) is, at present, mainly used for packaging medicines because of economy due to its compactness and facility of use by patients.

A container obtained by PTP comprises a plastic sheet having a medicine accommodating portion and an aluminium foil sheet which is attached to the plastic sheet in a manner to cover the medicine accommodating portion of the plastic sheet. With respect to medicines for which a high moisture proof facility is not so required, a polyvinyl chloride sheet is used. With respect to medicines for which a moisture proof facility is required, a polyvinylidene chloride coating polyvinyl chloride sheet is used.

Among medicines accommodated in a PTP container, some medicines emit carbonic acid gas, hydrogen sulphide gas, trimethylacetic acid gas and the like. Carbonic acid gas emitted from medicines is odourless, and hydrogen sulphide gas and trimethylacetic acid gas emit offensive odour, respectively.

In a plastic sheet, including vinyl chloride, for a PTP container, gas permeability resistance is relatively high, and the moisture proof facility is, however, low to cause medicines accommodated in the container to react on moisture whereby the medicines are discoloured and effect of medicines are decreased.

In a plastic sheet, including polyvinylidene chloride coating polyvinyl chloride, for a PTP container, the moisture proof facility is high, and, however, gas permeability is not high. Therefore, in case that medicines emitting gas are enveloped in the container, gas emitted from the medicines cannot easily pass through the plastic sheet, and the inner pressure of the medicine accommodating portion is increased. Resultantly, there may be a case wherein a seal portion is broken due to expansion of the medicine accommodating portion.

In a plastic sheet, including polypropylene, for a PTP container, the moisture proof facility and gas permeability are high to overcome the above problems. However, since the plastic sheet including polypropylene has good gas permeability, in case that hydrogen sulphide gas or trimethylacetic acid gas is emitted from medicines enveloped in the container, offensive or foul odour is emitted near a place where the medicines are stored to influence environment badly and to give an unpleasant feeling to patients.

JP-A-63151451 relates to a multi-layered packing material characterised by at least two layers including a thermo-plastic resin layer and a thermoplastic resin layer containing porous powder of 2 to 50% by weight. The embodiments described are essentially comprised of two layers, with disclosure only of the possibility that another filling agent (filler), colouring agent or oxidation preventing agent may be added to the two resin layers as occasion demands.

It is an object of the present invention to provide a container for packaging medicines which has a moisture proof facility and absorbs odorous ingredients emitted from the medicines enveloped in the container thereby to prevent emittance of offensive or foul odour.

According to this invention, there is provided a container for packaging a medicine which is accommodated in a space formed by a sheet, characterised in that said sheet comprises:

an inner polypropylene layer opposed to the medicine accommodated in said container;

an intermediate olefin layer of polyethylene into which a deodorising agent is mixed and forms at least a part of said container; and

an outer polypropylene layer said olefin layer being sandwiched between the inner and the outer polypropylene layers.

The nature, utility, and further features of this invention will be more clearly apparent from the following detailed description with respect to preferred embodiments of the invention when read in conjunction with the accompanying drawings briefly described below in which:-

Figure 1 is an elevational sectional view of a container for packaging medicines wherein the container according to this invention is adapted for a PTP container; and

Figure 2 is an elevational sectional view of a container for packaging medicines, showing another embodiment of this invention.

Figure 1 shows a container C_1 for packaging a medicine 3 according to this invention. The con-

tainer C_1 is formed by PTP (Press Through Packaging) method. The container C_1 comprises a flat aluminium foil sheet 1 and a plastic sheet 2 cooperating with the aluminium foil sheet to envelope the medicine 3 therein. The plastic sheet 2 is so formed as to have a space 4 for accommodating the medicine 3 in the form of a capsule or tablet. The plastic sheet 2 and the aluminium foil sheet 1 are attached to each other at positions around the space 4 by means of an adhesive or heat sealing.

The plastic sheet 2 is a laminated film which has an intermediate polyethylene layer 7 into which a deodorizing agent (deodorizer) is mixed and which is sandwiched between an inner layer 5 and an outer layer 6, each of which comprises a polypropylene film. Instead of polyethylene layer 7, other olefin layers may be used. The thicknesses of the three layers 5, 6 and 7 are e.g., 20 , 300 , and 50 , respectively. As deodorizing agents, flavonoid, molecular sieve and inorganic metal salt are preferable.

In such a container C_1, a gas ingredient emitted from the medicine 3 accommodated in the medicine accommodating space 4 of the PTP container passes through the inner layer 5 of the polypropylene film having a high gas permeability without passing through the aluminium foil sheet 1 which does not permit a gas to pass therethrough. The gas having passed through the inner layer 5 reaches the intermediate polyethylene layer 7, and foul or offensive odour ingredients included in the gas are absorbed or neutralised to resolve by a deodorizing agent mixed into the intermediate polyethylene layer 7 thereby to remove foul odour emitting gas ingredients such as a hydrogen sulphide gas and a trimethylacetic acid gas. Thereafter, a gas from which the foul odour ingredients are removed passes through the outer polypropylene layer 6 to be emitted outside. In the container C_1, the thickness of the inner polypropylene layer 5 is determined relatively thin in comparison with that of the outer polypropylene layer 6 thereby to lengthen residence time of the gas in the intermediate polyethylene layer 7. This lengthens the time when the gas is subjected to absorption and neutralisation resolution of the gas by the deodorizing agent and increases efficiency of deodorization.

Figure 2 shows another embodiment of this invention. In Figure 1, as a container for packaging medicines, a PTP type container is used. However, as shown in Figure 2, the medicine 3 may be enveloped in the space 18 of a bag-like container C_2 which comprises two plastic sheets 12 and 13, each of which has the same construction as that of the plastic sheet 2 of Figure 1. The portions around the space 18 of each plastic sheet are heat-sealed in a state wherein the inner layers 15a and 15b of polypropylene are opposed to each other. Each of intermediate layers 16a and 16b of polyethylene includes a deodorizing agent, and two other layers 17a and 17b of polypropylene are attached to the two intermediate layers 16a and 16b, respectively. Further, the deodorizing agents are not limited to the above flavonoid, molecular sieve and inorganic metal salt, and other deodorizing agents may be mixed into the intermediate layers.

In accordance with the increase of the amount of foul odour gas emitted from medicines enveloped in a container, the mixing ratio of a deodorizing agent into the polyethylene layer may be increased or the thickness of the polyethylene layer including a deodorizing agent is increased. In addition, a deodorizing agent may be mixed into the outer polypropylene film. In case that a gas with a remarkably bad smell is emitted in large quantities, it is effective that the PTP container is accommodated into a bag which is formed with a laminated sheet comprising a polypropylene film and a polyethylene layer into which a deodorizing agent is mixed.

According to this invention, the intermediate polyethylene layer into which a deodorizing agent is mixed absorbs foul odour ingredients emitted from medicines enveloped into the container and prevents the foul odour from being emitted outside. Accordingly, since emittance of foul odour does not occur near a place where the container is stored, there is no undesirable influence to environment and an uncomfortable feeling is not given to patients.

Furthermore, as the polypropylene film has a moisture proof facility, medicines enveloped into the container do not discolour and the effect of the medicines does not decrease.

Claims

1. A container (C_1, C_2) for packaging a medicine (3) which is accommodated in a space (4, 18) formed by a sheet, said sheet (2, 12, 13) comprising:

   an inner polypropylene layer (5, 15a, 15b) opposed to the medicine (3) accommodated in said container (C_1, C_2);

   an intermediate olefin layer (7, 16a, 16b) of polyethylene into which a deodorising agent is mixed and forms at least a part of said container (C_1, C_2); and

   an outer polypropylene layer (6, 17a, 17b), said olefin layer (7, 16a, 16b) being sandwiched between the inner (5, 15a 15b) and the outer polypropylene layers (6, 17a, 17b).

2. A container according to Claim 1, wherein said container (C_1) further comprises a flat alumin-

ium foil sheet (1), said laminated sheet (2) being attached to said aluminium foil sheet (1) at positions around said space (4) to envelope said medicine (3).

3. A container according to Claim 1, wherein said container (C_2) comprises two laminated layers (12, 13) being joined with each other to form said space (18) for accommodating said medicine (3).

4. A container according to Claim 2 or 3 wherein a thickness of said inner polypropylene layer (5, 15a, 15b) is determined thin in comparison with that of said outer polypropylene layer (6, 17a, 17b).

5. A container according to Claim 4 wherein thicknesses of said inner (5, 15a, 15b), intermediate (7, 16a, 16b) and outer layers (6, 17a, 17b) are 20 u, 50 u, and 300 u, respectively.

Patentansprüche

1. Behälter (C_1, C_2) zum Verpacken eines Arzneimittels (3), das in einem von einem Bogen gebildeten Raum (4, 18) aufgenommen wird, wobei der genannte Bogen (2, 12, 13) eine dem im genannten Behälter (C_1, C_2) enthaltenen Arzneimittel (3) gegenüberliegende innere Polypropylenschicht (5, 15a, 15b), eine mittlere Olefin-Schicht (7, 16a, 16b) aus Polyethylen, der ein Desodorierungsmittel beigemischt ist und die mindestens einen Teil des genannten Behälters (C_1, C_2) bildet, und eine äußere Polypropylenschicht (6, 17a, 17b) umfaßt, wobei die genannte Olefin-Schicht (7, 16a, 16b) zwischen der inneren (5, 15a, 15b) und der äußeren Polypropylenschicht (6, 17a, 17b) zwischengelegt ist.

2. Behälter gemaß Anspruch 1, wobei der genannte Behälter (C_1) noch zusätzlich eine flache Aluminiumfolie (1) umfaßt, wobei der genannte laminierte Bogen (2) an um den genannten Raum (4) herum angeordneten Positionen am genannten Aluminiumfolienbogen befestigt ist, um das genannte Arzneimittel (3) einzuschließen.

3. Behälter gemaß Anspruch 1, wobei der genannte Behälter (C_2) zwei laminierte Bögen (12, 13) umfaßt, die miteinander verbunden sind, um den genannten Raum (18) zur Aufnahme des genannten Arzneimittels (3) zu bilden.

4. Behälter gemaß Anspruch 2 oder 3, wobei eine Dicke der genannten inneren Polypropylenschicht (5, 15a, 15b) im Vergleich zu der der genannten äußeren Polypropylenschicht (6, 17a, 17b) als dünn erachtet wird.

5. Behälter gemäß Anspruch 5, wobei die Dicke der genannten inneren (5, 15a, 15b), mittleren (7, 16a, 16b) und äußeren (6, 17a, 17b) Schichten 20 u bzw. 50 u und 300 u beträgt.

Revendications

1. Un récipient (C_1, C_2) destiné à l'emballage d'un médicament (3) qui est logé dans un espace (4, 18) constitué d'une feuille, ladite feuille (2, 12, 13) comportant :
   une couche interne en polypropylène (5, 15a, 15b) posée contre le médicament (3) logé dans ledit récipient (C_1, C_2) ;
   une couche intermédiaire en oléfine (7, 16a, 16b) de polyéthylène, dans laquelle on a mélangé un agent désodorisant et qui constitue au moins une partie dudit récipient (C_1, C_2) ; et
   une couche externe en polypropylène (6, 17a, 17b), ladite couche en oléfine (7, 16a, 16b) étant prise en sandwich entre les couches en polypropylène interne (5, 15a, 15b) et externe (6, 17a, 17b).

2. Un récipient, selon les stipulations de la revendication 1, dans le cadre de laquelle ledit récipient (C_1) comporte en outre une feuille aluminium plate (1), ladite feuille stratifiée (2) étant attachée à ladite feuille aluminium (1) à des endroits situés sur le périmètre dudit espace (4) pour envelopper ledit médicament (3).

3. Un récipient, selon les stipulations de la revendication 1, dans le cadre de laquelle ledit récipient (C_2) comporte deux couches stratifiées (12, 13) jointes l'une à l'autre afin de constituer ledit espace (18) pour recevoir ledit médicament (3).

4. Un récipient, selon les stipulations de la revendication 2 ou 3, dans le cadre de laquelle l'épaisseur de ladite couche interne en polypropylène (5, 15a, 15b) est considérée comme étant mince par rapport à celle de la couche externe en polypropylène (6, 17a, 17b).

5. Un récipient, selon les stipulations de la revendication 4, dans le cadre de laquelle les épaisseurs de ladite couche interne (5, 15a, 15b), intermédiaire (7, 16a, 16b) et externe (6, 17a, 17b) sont respectivement de 20 u, 50 u et 300

u.

FIG. 1

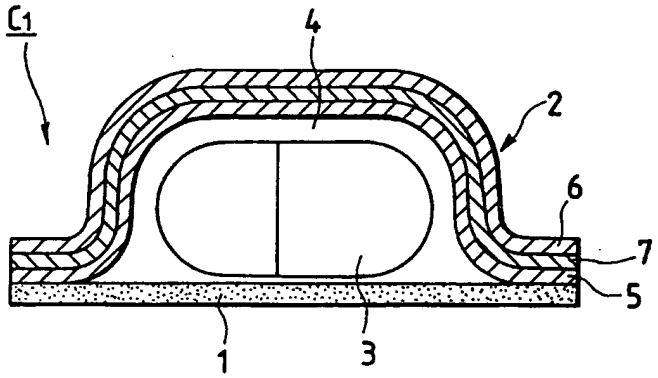

FIG. 2